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UNITED STATES DEPARTMENT OF AGRICULTURE  
Soil Conservation Service  
Washington, D. C.

FIELD MEMORANDUM #SCS 1091

Re: Mapping and Classifying  
Land Needing Drainage or  
Irrigation, or Subject  
to Overflow.

Date: May 15, 1943

TO ALL RANKING FIELD OFFICERS:

Land and water factors in addition to soil, slope, and erosion are to be recorded on soil conservation survey maps wherever information not covered in these 3 factors is needed for land management recommendations. Additional information needed in some areas are watertable, feasibility of drainage, susceptibility to overflow, availability of water for surface flooding or irrigation. Others may be alkalinity and salinity.

Regional chiefs of soil conservation surveys will be responsible for determining, for each area surveyed, whether in the survey legend additional symbols are needed to denote these or other factors. In doing this they will consult with drainage and irrigation engineers as may be necessary. A legend fully describing the conditions to be mapped and the symbols to be used is to be approved by the inspector in the usual way, before mapping is started.

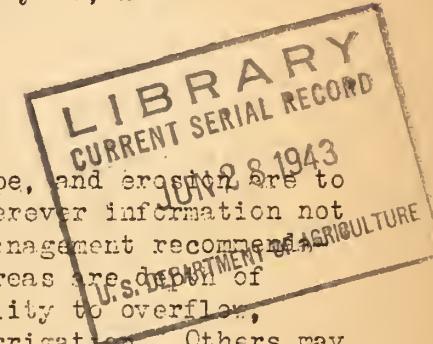
Depth of Watertable

No special symbols are needed where the watertable remains so low as not to interfere with the growth of vegetation (usually about 5 feet), or where needed drainage has been established and the installations require no special maintenance. If the watertable affects crops and other vegetation adversely, use symbol h for high watertable and l for low watertable within the 5-foot depth.

Each area should be investigated before a survey is started. If data are not already available, arrangements are to be made to examine the watertable from time to time during the course of the survey.

Susceptibility to overflow

Land subject to overflow sufficiently severe to damage crops will be designated by the symbols s for overflows that are likely to prove particularly hazardous to crops and d where overflow prevents the growing or harvesting of a crop. Probable flood damage can best be estimated after studying the prior history of an area. Each survey area is to be investigated, the significant differences in types of overflow damage are to be determined, and the legend is to be set up showing the



significant conditions that are to be mapped.

Feasibility of drainage, utilization of surface waters, and protection from overflow.

A special survey may be needed in some localities to determine the feasibility of drainage, utilization of surface waters, or protection from overflow. Local experience will commonly supply the information necessary to classify parts of fields or relatively small tracts.

Consultation with competent drainage or irrigation engineers is advisable before starting a soil conservation survey in an area where wet lands exist, or where irrigation is proposed. If the engineers do not have the facts needed to set up mapping units and land classifications, the final classification of the land must be deferred until an adequate engineering survey can be made. A tentative classification can be made for local use, but this should be done only if there is an immediate demand for the information.

Requests for these special purpose surveys should be made only after the land owners or operators have expressed interest in cooperating in projects having to do with drainage, utilization of surface waters, or protection from floods.

Symbols to denote feasibility of drainage or irrigation will consist of a small letter, x, w, y or z, placed after the complete symbol.

- x. Drainage feasible
- w. Drainage not feasible
- y. Irrigation feasible
- z. Irrigation not feasible

Each legend is to contain specific instructions giving the soils or other conditions where these symbols are to be used.

Classification of land needing drainage or protection from overflow

Feasibility of drainage or control of overflow, the nature and complexity of drainage or diking operations, and the suitability of the land for cultivation or permanent vegetation after drainage or diking are the factors that will determine the land capability class. Land suitable for cultivation after drainage, diking, or use of other means of water control, should be placed in class III if the task is of an extensive or difficult nature, but, if satisfactory drainage can be accomplished with a few ditches, or if low dikes can be established to keep out damaging overflow (simple undertaking), the lands should be placed in class II, if they are productive.

Land on which artificial drainage is feasible or has been established should be placed in class I, II, or III, depending on difficulties of maintaining the drainage, or land use controls or restrictions of other kinds. Some types of land that can not be perfectly drained should be placed in class IV if after drainage they are suitable for only an occasional crop, or their use limited to the growth of only a few crops.

Land not suitable for drainage which can be used for such purposes as pasture and woodland, should be placed in class V if it can be used without special controls or restrictions. Other land that can not be drained artificially or that can be only partially drained or protected from overflow will be placed in class VI or class VII if special controls or restrictions are needed in order to utilize the vegetation.

Permanently wet land, covered with water throughout most of the growing season and unsuitable for pasture or forest, should go into class VIII.

#### Classification of land suitable for or under irrigation

In areas of very low rainfall, land capability depends on the feasibility of irrigation or utilization of flood waters for the growth of crops, the difficulties of delivering water to the land, amount of available water, and dependability of supply, as well as factors affecting tillage, erosion, drainage, and growth of crops after water is supplied.

The need for irrigation must be considered in the land capability classification, wherever surface-applied water is necessary in order to grow a crop. It does not affect the classification in those areas where crops may be grown without irrigation, although water may be applied to some of the land to increase yields or to grow special crops.

Where irrigation is not feasible and the land unsuitable for cultivation without it the land should be placed in one of the classes from V to VIII. If irrigation is feasible or water has already been delivered to the area, the land should be placed in class I, II, or III, provided it is otherwise suitable for cultivation. Cultivable land not now irrigated, on which the delivery of water is feasible but the operations required to distribute the water on the land properly are of an extensive or difficult nature because of topography or soil conditions, should be placed in class III. Land suitable for cultivation on which water can be supplied by a simple gravity system or pump system should be placed in class II. Land suitable for cultivation on which water can be supplied without any special practice, should be placed in class I. If the full amount of water needed for crops cannot be delivered, either

because of situation or lack of water, the land should go into class II, III, or IV, according to need for additional practices. If the water contains enough soluble salts to make crop production hazardous, that factor should be considered along with others in deciding on the classification.

Land lying below a main irrigation ditch, on which water cannot be supplied for crops but which is suitable for permanent vegetation should go into class V, VI, or VII, depending on the long time requirements for adequate maintenance of vegetation. Land incapable of cultivation or of producing valuable vegetation should go into class VIII.

All factors affecting good land use and proper management must, of course, be considered in the usual way in classifying land now irrigated or proposed for irrigation, subject to high watertable or overflow.

Follow present mapping legend

Several different kinds of symbols are now being used to designate one or more of these features. Legends already in use and approved need not be changed unless it seems desirable to do so, and then only after approval by the field inspector. However, for uniformity, all new legends are to be set up in accord with the recommendations in this memorandum.

The relationship of all mapping symbols to land capability classes is to be shown clearly in the classification table, in order that the proper color or Roman numeral may be applied to the map.



Chief.